PILOT STUDY ON THE CONTROL OF MALAYAN FILARIASIS IN SOUTH SULAWESI, INDONESIA

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Suatu percobaan untuk memberantas penyakit filaria yang disebabkan oleh **Brugia malayi** *telah dilakukan disuatu daerah transmigrasi di Kecamatan Mangkutanah, Kabupaten Luwu, Sulawesi Selatan.*

Untuk penyelidikan ini telah dipilih dua desa, Kalaena yang penduduknya seluruhnya terdiri dari transmigran dari Jawa Tengah dan Jawa Timur, dan desa Margolemboyang penduduknya terdiri dari transmigran berasal dari Jawa Tengah dan Jawa Timur dan penduduk asli Sulawesi Selatan. Microfilaria rate didesa Kalaena 33.0 per cent sedangkan didesa Margolemboyang 40,5 per cent.

Obat yang diberikan adalah diethylcarbamazine (Hetrazan, Lederle) dengan dosis 4 mg./Kg. bb. selama 10 hari.

Didesa Kalaena seluruh penduduk yang berumur satu tahun keatas diberikan obat (mass treatment) sedangkan didesa Margolembo pengobatan hanya diberikan kepada mereka yang darahnya mengandung microfilaria (selective treatment).

Satu tahun kemudian darah dari seluruh penduduk kedua desa tersebut diperiksa kembali dengan hasil sebagai berikut:

Didesa Kalaena microfilaria rate berkurang dari 33,0 per cent sampai 3,7 per cent, microfilaria density dari 12,1 sampai 0,4 dan MfD50 dari 9,9 sampai 5,8. Didesa Margolembo microfilaria rate turun dari 40,5 per cent sampai 9,5 per cent, microfilaria density dari 11,6 sampai 1,7 dan MfD50 dari 10,9 sampai 4,6.

Untung rugi mass treatment dan selective treatment dibahas secara singkat. Menurut pendapat kami didaerah filaria dengan derajat endemik tinggi sebaiknya diberikan mass treatment.

Successful control of Malayan and bancroftian filariasis by the use of diethylcarbamazine has been done in many parts of Southeast Asia and Inslands of the Pacific using various dosages of the drug and diverse regimens (Beye, et al. 1953; Kessel, 1957; Sasa, 1963; Harinasuta, et al. 1964; Ciferri, et al. 1969; Kessel, et al. 1970; Harinasuta, et al. 1970; Ramachandran, 1970; Kessel, 1971). Although the diseases have been recognized as public health problems in Indonesian since 1930 (Brug) control measures had not been implemented until recent years. This paper reports the results of pilot experiments on the control of Malayan filariasis in two small villages in the Sub District of Margolembo, South Sulawesi, Indonesia among Javanese transmigrants and native Sulawesians using diethylcarbamazine. The purpose of the study was to evaluate mass and selective treatment programs and to obtain information that would be applicable for future control measures in Indonesia.

MATERIALS AND METHODS

The first village (Kalaena) in which the trials were conducted had a population consisting of approximately 250 Javanese transmigrants and their descendants who resided in the area since 1939. A survey of 215 inhabitants in this village in 1970, showed a microfilarial rate of 33.0 per cent (Partono, et al. 1972).

The second village (Margolembo) had a mixed population of 1939 Javanese transmigrants, second and third generation Javanese

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and native Sulawesians. The population numbered approximately 500 and a 1970 survey of 270 people showed a microfilarial rate of 32.5 per cent. Since only slightly more than one-half of the population was examined in 1970, a second survey was done in January 1971 in order to more accurately establish the numbers of microfilarial carriers. In the second survey 365 people were examined and a microfilarial rate of 40.5 per cent was determined.

The drug control program was initiated in February 1971. All of the inhabitants in the first village over one year of age were treated by administering 4 mg of diethylcarbamazine (Hetrazan, Lederle) per kilogram of body weight for 10 consecutive days. In the second village a selective program was initiated whereby only individuals with microfilaremia received the drug at the same dosage levels as people in the first village. Mass treatment was given in Village I because the people were very cooperative and well disciplined. The daily dosage schedule was preferred because the area was isolated and travel into it was limited.

Prednisone and an antihistamine preparation (Chlorpheniramine maleate) were given concommitantly during the first two days of treatment to moderate side reactions commonly associated with the use of diethylcarbamazine. The people were cautioned that some side effects may be witnessed and when the reactions occurred they were mild and transient and medically controled. All of the drugs were administered under rigid medical supervisions.

To evaluate the program blood surveys were repeated in both villages approximately one year after treatment. In all of the blood surveys quantitated (20 mm^3) finger bloods were obtained at night, thick blood films made and stained with Giemsa.

RESULTS AND DISCUSSION

The results of the study were evaluated by comparing the microfilarial rates and microfilarial densities before and after treatment. (Table 1)

Table 1. Microfilarial Rates and Densities in Two South Sulawesi Villages Before and After Mass and Selective Treatment with Diethylcarbamize.

		Pre-treatment				Post-treatment			
			Microfilaria Positive				Microfilaria Positive		
Village	Population	No. Examined	No.	Per cent	Microfilaria Density	No. Examined	No.	Per cent	Microfilaria Density
I	250	215	71	33.0	12.1	218	8	3.7	0.4
II	500	365	148	40.5	11.6	420	40	9.5	1.7

Tb. 1 In Village I in which all of the inhabitants were treated, the microfilarial rates decreased from 33.0 per cent to 3.7 per cent and the microfilarial densities from 12.1 to 0.4. In Village II where the people were selectively treated the microfilarial rate decreased from 40.5 per cent to 9.5 per cent and the microfilarial density from 11.6 to 1.7.

Table 2 presents the frequency distribution and cummulative percentages of microfilarial carriers for both villages before and after treatment. Tb. 2 The median microfilarial count, MfD50, for the first village was 9.9 and the second village 10.9 microfilariae per 20 mm^3. One year later following mass treatment of the population the MfD50 in the first village decreased to 5.8 and in the second village, to 4.6. Fig. I, II. (Fig. I and II). The method described in the Second WHO Expert Committee Filariasis (1967) was used to estimate the median microfilaria density from frequency distributions of microfilaria counts in a single survey. Probits of the cumulative frequencies were plotted against the

Table 2. Comparasion of Frequency Distribution of Microfilarial Counts in Two South Sulawesi Villages Before and After Mass and Selective Treatment with Diethylcarbamazine.

Microfilaria Counts (20 mm³)	Village I (Mass Treatment)				Village II (Selective Treatment)			
	Pre-treatment		Post-treatment		Pre-treatment		Post-treatment	
	Frequency	Cumulative per cent	Frequency	Cumulative per cent	Frequency	Cumulative per cent	Frequency	Cumulative per cent
1	10	14.1	1	12.5	11	7.4	11	27.5
2	6	22.5	1	25.0	11	15.0	1	30.0
3	7	32.4	0		8	20.3	2	35.0
4	3	36.4	0		7	25.0	3	42.5
5	1	38.0	1	37.5	4	27.7	4	52.5
6	0		0		4	30.4	1	55.0
7	1	39.4	0		6	34.4	0	
8	1	40.8	1	50.0	8	39.9	0	
9	1	42.3	0		8	45.3	1	57.5
10	0		0		1	45.9	2	62.5
11-20	6	50.0	3	87.5	24	62.2	5	75.2
21-30	4	56.3	0		14	71.6	3	77.5
31-40	7	66.2	1	100.0	8	77.0	2	87.5
41-50	9	78.9			10	83.8	0	
51-60	5	85.9			8	89.2	1	90.0
61-70	1	87.3			3	91.2	1	92.5
71-80	1	88.9			2	92.6	0	
81-90	2	91.5			1	93.2	2	97.5
91-100	0				1	93.9	0	
101-200	4	97.2			6	97.8	1	100.0
201-300	1	98.6			3	100.0		
301-400	1	100.0						
Total	71		8		148		40	

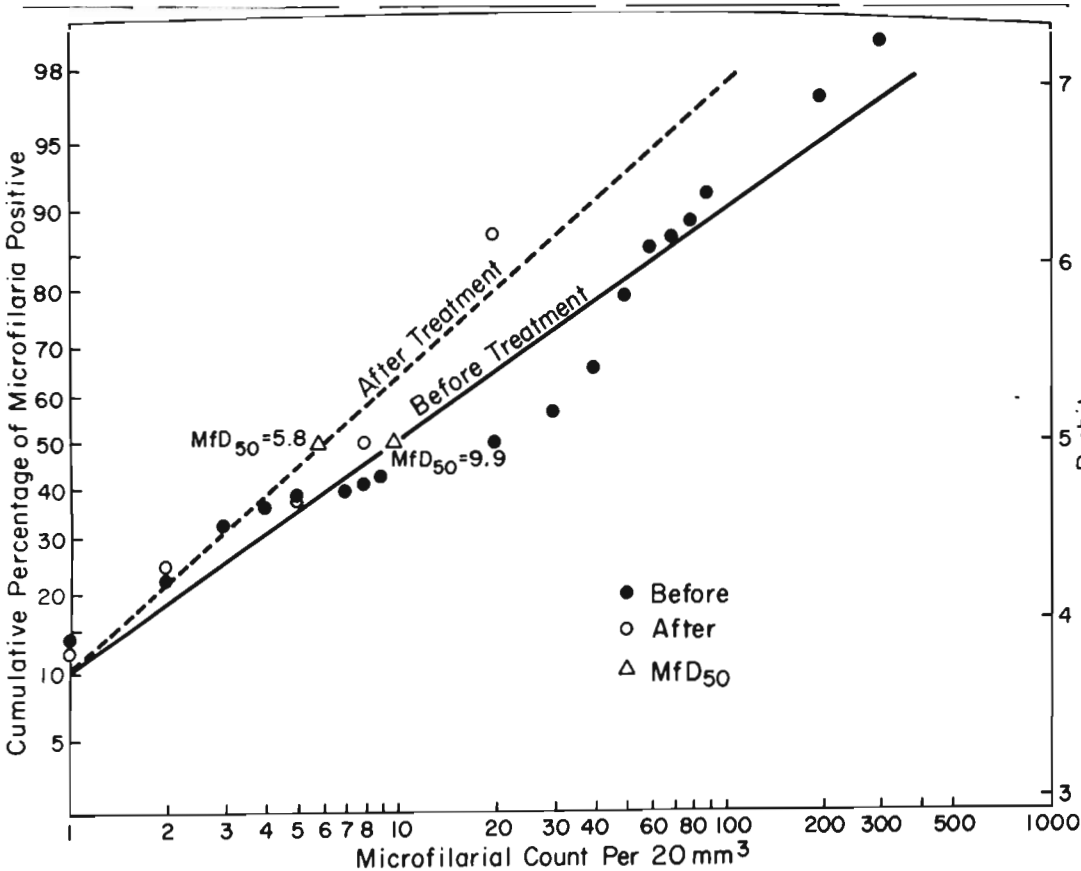

Fig. 1. Regression Lines of Cumulative Percentage Distribution of Microfilarial Density before and After Mass

had microfilariaemias during the pre-treatment survey but the counts could have been too low for detection. Others may have been individuals in the incubation period and subsequently these individuals were not given treatment in the selective treatment program. Positive individuals that were not examined during the pre-treatment survey were also a potential source of reinfection for others and in many instances their microfilarial counts were relatively high.

There were no new comers in Village I. In Village II however, the people commonly moved from one village to another. Four new comers were found positive; 3 with microfilarial counts of less than 10 and one with 90 microfilariae/20 mm^3 of blood.

Side effects to diethylcarbamazine were relatively few and daily activities could be continued. The hazards associated with cortisone were fully realized, however, the main purpose of this drug was to lessen the severty of side reactions and thus obtain maximal cooperation of the people. This is an absolute essential for a successful control program.

The advantages and disadvantages of mass and selective treatment are summarised in Table 4.

Table 4. Advantages and Disadvantages of Mass and Selective Treatment for Filariasis with Diethylcarbamazine.

Method of Treatment	Cost of			Chances for Misdiagnosis	Post-treatment Microfilarial Counts	Results
	Drug	Labor for				
		Drug Dispensing	Blood Processing			
Mass	Expensive	Greater	Smaller Sample ↓ Less	None	Shifts to Lower Counts	Superior
Selective	Less Expensive	Less Expensive	Larger Sample ↓ More	- Low Counts - Incubation Period - Technical Errors	Unexamined Positive ↓ Unaffected	Inferior

Tb. 4 In a mass treatment program the costs of drug and labor for drug dispensing are expensive. These extra cost, however, should be weighted against the extra cost of labor necessary to examine a greater percentage of population for better recoveries of positive individuals. This is highly important in a selective treatment program. It is recommended that in future control programs that locally assembled diethylcarbamazine be used (Filarzan, Mecosin Co) since it is less expensive than imported preparations. With selective treatment individuals with low counts or in the incubation period may be misdiagnosed, and not given treatment. Technical errors during blood processing and examination may be another source of misdiagnosis.

It is therefore the opinion of the authors that in a highly endemic filariasis area mass treatment of the population is more satisfactory than selective treatment. Furthermore, in a filariasis control program continuous vigilence is important and follow up administration of the drug may be necessary to maintain complete control of the disease.

SUMMARY

A pilot control program for Malayan filariasis using diethylcarbamazine was undertaken in a transmigration area in Margolembo, South Sulawesi, Indonesia. Two small villages were chosen and mass treatment was carried out in one village and selective treatment in the other by administering diethylcarbamazine in doses of 4 mg/kg body weight for 10 consecutive days. Approximately one year after treatment the populations were re-examined and the results were evaluated by comparing the microfilarial rates and densities before and after treatment. In the mass treated village, the microfilarial rate decreased from 33.0 per cent to 3.7 per cent, the microfilarial density from 12.1 to 0.4 and the MfD50 from 9.9 to 5.8. In the selective treated village, the microfilarial rate decreased from 40.5 per cent to 9.5 per cent, the microfilarial density from 11.6 to 1.7 and MfD50 from 10.9 to 4.6. The advantages and disadvantages, mass and selective treatments are discussed and it is the opinion of the authors that in a highly endemic areas the entire population should be treated rather than only those with microfilaremia.

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